



The reported incidence of campylobacteriosis modelled as a function of earlier temperatures and numbers of cases, Montreal, Canada, 1990-2006

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Abstract:

Previous studies have detected an effect of earlier temperatures on the incidence of campylobacteriosis in humans, but without adjustment for earlier numbers of cases of the disease. We estimated the effect of temperature on the number of cases notified by week in Montreal, Canada, from 1 January 1990 to 26 March 2006, simultaneously with the effect of the numbers of cases notified in the preceding weeks. The current campylobacteriosis count (week 0) was modelled by negative binomial regression, with earlier weekly average temperatures and earlier counts as predictors. Secular trends were accounted for by cubic spline functions and seasonal variations by sine-cosine functions. Indicator variables identified weeks with fewer than 5 working days. In the final statistical model, a 1A degrees C increase in temperature above 10A degrees C during any of weeks -1 to -6 was associated with a 0.8% (95% CI: 0.3% to 1.3%) increase in the current count. For each additional notified case during any of weeks -1 to -5 or -9 to -12, the increase in the current count was approximately 0.5% (95% CI: 0.2% to 1.0%). Thus, earlier temperatures and earlier counts have independent effects, that of temperatures being the larger one. The temperature effect is too small to require short term public health planning. However, in Montreal, an increase in average temperature of the order of 4.5A degrees C, forecast by some for 2055, could produce a 23% increase in incidence, resulting in about 4,000 excess cases per year.

Source: <http://dx.doi.org/10.1007/s00484-010-0345-x>

Resource Description

Exposure :

weather or climate related pathway by which climate change affects health

Food/Water Quality, Food/Water Quality, Temperature

Food/Water Quality: Pathogen, Pathogen

Temperature: Fluctuations

Geographic Feature:

resource focuses on specific type of geography

Urban

Geographic Location:

Climate Change and Human Health Literature Portal

resource focuses on specific location

Non-United States

Non-United States: Non-U.S. North America

Health Impact: ☒

specification of health effect or disease related to climate change exposure

Infectious Disease, Morbidity/Mortality

Infectious Disease: Foodborne/Waterborne Disease, Vectorborne Disease

Foodborne/Waterborne Disease: Campylobacteriosis

Vectorborne Disease: General Vectorborne

Model/Methodology: ☒

type of model used or methodology development is a focus of resource

Exposure Change Prediction, Outcome Change Prediction

Resource Type: ☒

format or standard characteristic of resource

Research Article

Timescale: ☒

time period studied

Medium-Term (10-50 years)